Evidence on the determinants of investment in Mexico (1993-2016)

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The aim of this paper is to show evidence of the determining factors of investment decisions in Mexico, for this, we discuss the importance of the level of economic activity as the main determinant, and the variables that derive from this one such as investor expectations and costs such e.g. the exchange rate. We emphasize the importance of the rate of return on investment and the zero effect of the interest rate on the investment. Finally, an ARDL model is presented, which confirms that the level of economic activity is the main cause, the exchange rate influences inversely and there is evidence of a crowding-out effect in the Mexican economy.

Key words: Investment, ARDL Model, Interest rate

JEL classification: E22, C39, E43

INTRODUCTION

One of the most important variables for economic growth is undoubtedly investment, since it activates effects on a large number of variables, a fact that has motivated an endless number of papers from the theoretical and empirical point of view, all in order to understand what is causing investment decisions.


The concept of effective demand developed by Keynes in 1936 or Kalecki in 1933 revolutionized the economic thought, because before this premise, it was almost agreed that the level of saving determined to the investment and therefore the interest rate, motivated the savings decisions. In these causalities was found that a higher interest rate would attract more savings, and logically larger funds available to investors; however the higher interest rate would also make the cost of money expensive, so borrowing would be at a higher price, something that would end up discouraging investment. This dilemma could be solved when there would be a point in the market, where the supply and demand of savings were equalized, so that both savings claimants and suppliers of it, might be willing to agree to a deal at the current rate or price, as well as the investment to be carried out. From this, it follows that an excess of savings demand is corrected with an increase in the interest rate, and an additional savings offer with a decrease in the same.

This combination of ideas let see clearly that for the traditional thought interest rate is the more relevant variable among the determinants of the investment, cause it is the regulator element between the offering and demand of credit, in a way that if it is not for the saving, both of them could not exists. Evidence in this regard is the conclusion to which arrives Castillo (2003), who argues that in Mexico the credit market conditions significantly influence investment decisions.

The previous model can certainly work when offer is assumed to be equal to demand, but unfortunately economies do not usually work that way, only they work with idle resources. A great interested in this subject was Michal Kalecki, who in several of his works discusses the effect of working with idle resources. Following the same school of thought, Steinld (1952) shows evidence of how the US economy worked well below its potential. On the other hand, López (1998) and Huerta (2006) present evidence of idle resources, in the Mexican economy.

Keynes (1936) also analyzes the behavior of an economy with idle resources, so in his theory he suggests that entrepreneurs not only take into account the interest rate when they want to invest in a business, but also pay...
attention to the expectations about the future behavior and the investment performance, which will depend on current demand. So that the more idle resources present, the lower potential growth will have, thus affecting the future expectations of businessmen.

Investors’ expectations play a crucial role in Keynes's theory because through them they can estimate what he calls the marginal efficiency of capital (Keynes, 1936).

In this estimation, entrepreneurs make certain assumptions supported by their expectations, consequently they set a certain sales target, however they are aware that their companies could work with idle resources, so that they consider a certain margin of error in their sales goal, in such way, that if the sales reached are within this margin, it can be considered that the objective has been achieved, and if the generated profits are higher than the interest rate paid by the price of money, then there will be reasons to reinvert (Keynes, 1936).

From other point of view in a different economic context, Kalecki gives low headship to the interest rates, since in his formulation he concludes that investment decisions depend on the level of economic activity and the rate of change of this level in previous periods (Kalecki, 1954).

Kalecki argues that investment decisions are highly related to what happens in the economy in past periods. This is so, since the result of previous years leaves certain gains or losses to the companies; in the event of the first happens, the economic units are obliged to separate a part as a legal reserve, which in Mexico is known as a reserve fund and is required by law to save 5 percent of net income (Article 20, LGSM1). To this Kalecki called gross capital accumulation of enterprises from their current profits, or current gross savings (Kalecki, 1954). In this regard an entrepreneur will decide to invest more as his savings are greater, because he will have the resources to finance the investment, but mainly he will do it because the existence of current gross savings is a symptom that the investment returned, which is a consequence of having participated in a market with enough potential, or in terms of Kalecki, a market with high inventory variation. Evidence of this in Mexico is reported by Alarco and Del Hierro (2007) who debate that the main source of investment financing is in the savings of the companies themselves.

The events occurring in past periods give signs of possible future behavior, this is why they motivate or discourage the investor. This variable is much more relevant than the price of money itself, which although it has a relevant role, becomes secondary to the ease with which the market can move inventories.

In this way, the interest rate is a necessary condition but not sufficient for the investment to be carried out, however, the level of economic activity or market potential is a necessary and enough condition for an investor to risk his or her resources.

The proof of the existence of other variables to cause investment decisions, can be found in works such as Acevedo and Mora (2008), who suggest that in the countries of Latin America a neutral legal system can just raise the investment rate up by 2.29 percent, while significant improvements of institutions in controlling corruption help the investment at the rate of 1.84%.

Therefore above, the objective of this paper is to demarcate the determinants of investment decisions in Mexico, based on the premise of effective demand, where we think that the level of economic activity or market potential is the main variable, which moves these decisions, above others like the interest rate. It should be noted that the most recent antecedent of a work like this for Mexico is found in Levy (1993), who concludes that for the period 1960-1985 the principle of acceleration is the best model to explain the determinants of investment in Mexico, this is that, demand proves to be the main cause of the investment.

The work contains three sections. In the first, presents a mechanism on how the expectations of investors can be generated and quantified. The second part talks about the importance of the rate of return and the phases that it can find according to the market where it is invested. The third section presents an ARDL model in which the determinants of investment decisions are estimated. Finally we have a section of conclusions.

Rate of return on investment and interest rate

Once exposed what the theory says, we must understand that an investor when having in front a project, decide to invest in it, first watching industry behavior in the recent past, then seeing the expectations about that same industry for the immediate future, and if the business is viable, then investors will ask what the interest rate is.

Activity data in the recent past is possible see through the economy activity, that is, GDP information to whichever industry, sells or other proxy variable.

Information on the expectations of the immediate future of that industry can be observed in Mexico through the indicators of business confidence published by National Institute of Statics, Geography and Informatics (INEGI2), which builds from the “Monthly Survey of Business Opinion” that the same institute applies periodically.

This indicator is generated once the entrepreneurs are asked about three topics, the right moment to invest, the economic situation of the country and the economic situation of their company, the last two issues provide information on the present and future immediate, nevertheless, in all three themes, entrepreneurs are always asked to respond by taking into account the present and comparing it with the previous 12 months (INEGI, 2016); from the above you can have information like the one reported in the Figure 1. In Figure 1 it can be observed the confidence index of three sectors of the Mexican economy, which is nothing more than the expectation of

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1 General Law of Commercial Companies in Mexico

2 INEGI is the entity responsible for collecting statistics in Mexico, also is responsible for its publication
businessmen. The indicator runs from 0 to 100, where 100 indicate a lot of confidence of the entrepreneur to invest and 0 sign of no confidence.

It is clear that expectations have come down sharply over the whole period graphing from June 2011 to November 2016, but with worse behavior for trade, with manufacturing being the least affected. It is notorious also that during 2015 and 2016 the problem got sharpened, which coincides with several important events, though from the macroeconomic point of view, we believe that the most important is the wave of depreciations of the exchange rate as seen in Figure 2.

In Figure 2 it can be seen that since the end of 2014 and until now the Mexican peso has not stopped losing its value
against the dollar. The depreciation rate between November 2014 and November 2016 is 46.83%. The question could be, how does this affect the expectation of entrepreneurs? The answer is simple, the depreciation of the national currency increases costs of imported inputs automatically, imported machinery and, of course, rises the cost of debt held in dollars, all of this darkens the business landscape.

We formerly commented that if investors would approve the two variables above, then they would see the interest rate. This indicator is not only a reference of the financial cost, which undoubtedly influences when the investment is financed, but, what happens when the investment is funded with own resources? Under these conditions the rate also has effect, since the investor looks at its opportunity cost, that means if he did not risk his resources in a productive project could invest in government bonds or another financial instrument.

In this way the investor must consider the interest rate or yield that could be paid by some financial instrument and to that must be added the expected rate of return. All this will allow him to calculate the marginal efficiency of capital as well as his rate of return and then evaluate whether the project which investor intends to participate in, will be profitable for him. Notwithstanding this, the interest rate will only come into play until a market opportunity is observed, not before.

Another question that may be done, is, what rate of return should investors expect on their money? In Mexico the Tax Administration System uses an estimated coefficient of utility, which is the rate of profit of the companies. The estimated coefficient is calculated by the tax authority based on the fiscal reports that each company of each economic activity reports periodically, and is used by them as a parameter of comparison between what the Mexican companies declare as utility and what the market shows, among other uses.

This indicator would be very clarifying for a better understanding of this document, cause it allows the investor to get an idea of the expected return on investment, so that if he obtained a bank loan at a rate of 20%, he would surely not accept to invest in the first four activities reported in the Table 1, and although he would see profits if he decided investing in one of the activities five to seven, this would be very minimal, in such wise that, maybe his decision is conditioned. With this logic, surely it would not happen if he decides to allocate his resources to the businesses dedicated to concepts ten onwards.

With this same table, spot that even when the rate falls by five percentage points, the first four activities will remain unattractive, being that, in such markets, a drop in interest rates will be sterile. On the contrary, a rise in the five-point rate would still leave attractive the possibility of investing in the last three options, but the efficiency of the interest rate as a policy to stimulate investment is discussed below.

### Chronology of theory in the business cycle

Products in any industry typically go through four stages in time according to Levitt (1981): introduction, growth, maturity, and decline.

The first phase is when the products are new and just launched. In this the sales are few, as it is not yet well known.

In the growth stage even if the good or service is already known, investment in the marketing mix must still be made, in order to achieve customer loyalty; however the investment is decreasing according to the acceptance of the product (Muñiz, 2015).

A product is mature, when it is already sold by itself, in others words, no investment is required in promotion, since the sales are given by the loyalty of consumers or by recommendation of themselves In the last stage, sales start to decrease compared to previous periods, so it is the moment when the product leaves the market.

From this model we can explain how the rate of return of the investment behaves according to the phase in the market where it is intended to invest. To do this, see the following figure:

In the image, the inversion return rate (g) is represented

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**Table 1. Estimated rates of return in Mexico by industry**

<table>
<thead>
<tr>
<th>Economic Activity</th>
<th>Presumptive coefficient of utility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trading of gasoline, oil and other mineral fuels</td>
<td>6.00%</td>
</tr>
<tr>
<td>Production of palm and straw hat</td>
<td>12.00%</td>
</tr>
<tr>
<td>Sale of soda an bottled bier</td>
<td>15.00%</td>
</tr>
<tr>
<td>Sale of books and office supplies</td>
<td>15.00%</td>
</tr>
<tr>
<td>Production of tortilla dough</td>
<td>22.00%</td>
</tr>
<tr>
<td>Movie theater</td>
<td>22.00%</td>
</tr>
<tr>
<td>Furniture creation</td>
<td>23.00%</td>
</tr>
<tr>
<td>Restaurants</td>
<td>25.00%</td>
</tr>
<tr>
<td>Production of perfumes and essences</td>
<td>27.00%</td>
</tr>
<tr>
<td>Manufacture of cement</td>
<td>39.00%</td>
</tr>
<tr>
<td>Property leasing</td>
<td>39.00%</td>
</tr>
<tr>
<td>Provision of independent professional services</td>
<td>50.00%</td>
</tr>
</tbody>
</table>

Source: Activities selected from Art. 58 of the Federation Fiscal Code
Arriaga and Leal

Figure 3: Phases of the rate of return on investment
Source: Own elaboration in Levitt (1981) base

on the ordinate axis and the inversion (I) is shown on the side of the abscissa. Figure 3 is divided into four channels. The first one we have called "Research and Development", is a stage where products from markets are still under investigation, hence, it is not yet known if they will generate some rate of return. In fact at this stage there is no return on investment. Usually companies that have a department of innovation and development or, they are about to launch some new good or service go through this stage. An example is social networking companies such as Facebook, which at its beginning was not clear that it was having some market value, however over time the company has managed to position itself as the most important in the field of social networks and with a pretty attractive rate of return; and precisely where the project begins to be profitable, the curve finds its inflection point and begins to generate returns. At this stage we have located all the businesses that have a rate of return with increasing returns to scale with respect to the investment. Here we will find all the products that go through the introduction phase and even some that live their stage of maturity.

In this stage, the return rate satisfy the following condition

\[
\frac{\partial g}{\partial I} > 1 \quad (1)
\]

That is, for every peso invested, the rate of return is greater than unity. The markets that have this characteristic are usually new or with innovative products where supply is low and demand is very high.

At some point in time when products are in their maturity phase, the market receives more competitors (assuming there are no barriers to entry) and market begins to be saturated, causing the investment to be no more attractive than at the beginning, nonetheless is still profitable for everyone. Things get worse when the excessive number of competitors or the already satisfied demand cause the rate of return to start generating constant returns to scale, which in Figure 1 marks the beginning of phase 3 and is observed represented as a straight line. Here the following condition is satisfied:

\[
\frac{\partial g}{\partial I} = 1 \quad (2)
\]

This means that the same amount is obtained from each peso invested. Under these terms the markets are no longer attractive to investors. When you reach this stage, the company that seeks to survive has to start innovating again; perhaps not with its product, but with the service or experience that makes it happen to the customer. Usually at this stage the consumer is facing substitute goods, and it is the challenge of the company that this is not supported. An
example may be casual clothing brands. If from each of them we take the same product in terms of type of material and design, we will find that the product fulfills its function, that is to dress who uses it, but that can give certain status to the consumer use a brand better known than another, even though both pieces of clothing may have been made by the same workshop. This way, the known mark could exit this phase and return to some point on the curve of the previous stage. If the other brand is not able to find something that differentiates it in the market, it will surely disappear, even if there are incentives for it like applying for a loan at a very low interest rate.

In many cases, public policy tends to be oriented towards supporting these types of companies with disastrous results, since this type of policies with a supply approach, assume that companies need resources to grow, so the solution is to offer them resources at rates very low, or in the most dramatic case at zero rate.

Mexico has been a living witness to this type of measures through the various public programs implemented year by year by the Ministry of Economy, where in recent years resources have been delivered at zero rate, with the only requirement that the investor contribute part of the cost of the project and some minor administrative requirements, all with the idea of creating new companies and that these in turn generate jobs.

In Figure 4 you can see what has been the result of this public policy. It is observed that between 2010 and 2014 the number of companies created grew 13.49%, however it is also outstanding that, between 2011 and 2014 the number of companies created falls by 1.03%, and what is worse, between 2013 and 2014 the business start-up rate fell by 2.50%.

These data show clear evidence that addressing companies from the supply side has not been the solution. The result would be more serious, if as it was mentioned by Hernandez et al. (2016) it is not good the number of companies that disappear between years(Figure 4).

In our point of view, this result is a consequence of directing policies to businesses that belong to markets with rates of return that present constant returns to scale and, in the worst case, decreasing returns to scale, which is the last phase of Figure 3, and which also coincides with the phase of decline in the product life cycle.

This time it is true that

$$\frac{\partial g}{\partial t} < 1$$

(3)

This is the worst phase that a market can experience, because of, for each peso invested, the return is less than 1. This can occur in markets that are not able to be updated to new trends. An example would be to invest in a company that produces rolls for camera, evidently this type of goods are completely out of the market, hence the companies of this line if they are not able to reinvent themselves will soon be out.

Returning to the public policy issue that seeks to stimulate investment through resources at a very low cost, Mexico has experienced that the resource is usually directed to
traditional businesses, where markets entering stage 3 or 4 of the phases of the rate of return on investment shown in Figure 1, where the result is to extend the agony of most of these companies, and that once the resource is exhausted, the company ends up closing its doors.

**An investment decisions determinants model**

In this section we will work to build an econometric model with the idea of finding from the macroeconomic point of view what motivates investment decisions.

For this, an autoregressive model with distributed lags will be estimated, which according to Ibarra (2011) allows unbiased estimates of the long-term parameters to be obtained, even if some exogenous variable is endogenous. Another goodness of this technique is that it allows obtaining results from combinations with series I(0) and I(1), the only condition in this respect is that there are not some type I(2). It is important to mention that for its construction the limits tests proposed by Pesaran, Shin and Smith (2001) are followed.

Before estimating the model, we will make a description of each variable. It should be mentioned that all belong to the period 1993.1 to 2016.2 with quarterly data and information from INEGI of Mexico.

The first variable is private investment (I), which shows gross capital formation at constant prices this variable is cyclical variable, since the first quarter of each year shows its lowest part, while at the end of the year it is observed at its highest peak. Its trend is bullish, although it shows important falls in the two strongest crises that the country went through, both in 1994 and in 2008.

The next variable is the exchange rate (e). Earlier it was mentioned that the exchange rate can have a significant influence on the expectations of the investors since it raises many costs and ends up affecting the rate of return. On this regard, we believe that in scenarios with expected depreciations, the investment will be rushed away.

Another interesting point to consider is the behavior of public expenditure (G). The idea of including this variable is to verify if, there is what is known in the literature as crowding-out, or it is a complement of the investment. According to what it is shown in relation to the impact of the public policy on the investment seems not to be such efficient, at least not when it is destined directly to the creation of investment projects, reason why a negative sign in the relationship of both variables, even though public spending goes beyond just the policies implemented by the Ministry of Economy. Next variable is interest rate (r), which is constructed from the CETE\(^3\) data to 28 days in nominal terms. Its bearish tendency is very evident, so according to conventional theory the investment should have been stimulated in an important way, however from the approach used in this work, it is believed that the effect will be sterile.

The last is GDP data at constant prices (y). According to Kalecki's theory, this should be the main determinant of investment decisions, since the level of economic activity will see the capacity of the market to move inventories, as well as generate a good rate of return, which will be reflected in current gross saving. All of the above will tend to motivate or discourage investment decisions.

Once set, the previous, the model to estimate comes from the following

\[
\Delta I_t = \alpha_0 + \alpha_1 \Delta I_t + \alpha_2 \Delta I_{t-1} + \alpha_3 \Delta I_{t-2} + \alpha_4 \Delta I_{t-3} + \alpha_5 \Delta I_{t-4} + \beta_1 \Delta et + \beta_2 \Delta et_{t-1} + \beta_3 \Delta et_{t-2} + \beta_4 \Delta et_{t-3} + \beta_5 \Delta et_{t-4} + \epsilon_1 \Delta rt + \epsilon_2 \Delta rt_{t-1} + \epsilon_3 \Delta rt_{t-2} + \epsilon_4 \Delta rt_{t-3} + \epsilon_5 \Delta rt_{t-4} + \gamma (4)
\]

Where:

- \(\Delta\): refers to the first difference of the variable
- \(t-n\): refers to the lag "n" of the variable in question
- \(\alpha, \beta, \epsilon, \gamma\): are the parameters
- \(\gamma\): is the error term

**MODEL RESULTS**

As noted above, it is a necessary condition that within the series of the model there is no type I(2), so it is necessary to verify this with the necessary statistical rigor.

To obtain accurate conclusions, the series have been submitted to the Dickey-Fuller and Phillips-Perron tests with three different models for each test. The results are presented in Table 2:

As it can be seen, there is no evidence of series I (2), then is possible go on with the model.

In the final specification of the model are expressed to all variables in logarithms, except the interest rate. It was found according to the Akaike and Schwarz criteria that the optimal number of lags was 4. The final results are as follows(Table 3):

In this Table 3, the first thing to note is that the parameters are significant. According to the data, investment, public spending and GDP are significant at 95%, the exchange rate is at 90%, while the interest rate is not significant, a fact that has a lot of relevance in our model, therefore we will come back later with its analysis. The variable V (-1), which shows the model's speed of adjustment, that is also observed, which is 0.3126 in absolute

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\(^3\)CETE is a Mexican Government bond
Table 2. Test Dickey Fuller Augmented and Phillips-Perron

<table>
<thead>
<tr>
<th>Variable</th>
<th>Dickey-Fuller added (ADF)</th>
<th>Phillips-Perron (PP)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No constant or trend</td>
<td>With constant</td>
</tr>
<tr>
<td>I</td>
<td>0.9918</td>
<td>0.8763</td>
</tr>
<tr>
<td>∆I</td>
<td>0.0001</td>
<td>0.0000</td>
</tr>
<tr>
<td>e</td>
<td>0.9968</td>
<td>0.8508</td>
</tr>
<tr>
<td>∆e</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>G</td>
<td>0.9969</td>
<td>0.9974</td>
</tr>
<tr>
<td>∆G</td>
<td>0.0036</td>
<td>0.0036</td>
</tr>
<tr>
<td>r</td>
<td>0.1677</td>
<td>0.4297</td>
</tr>
<tr>
<td>∆r</td>
<td>0.0000</td>
<td>0.0002</td>
</tr>
<tr>
<td>y</td>
<td>0.9998</td>
<td>0.8400</td>
</tr>
<tr>
<td>∆y</td>
<td>0.0997</td>
<td>0.0009</td>
</tr>
</tbody>
</table>

Significance level of 95%
ADF: Ho= A unit root exists
PP: Ho= A unit root exists

Source: Own elaboration with series drawn from INEGI

Table 3. Results of the long-term model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard error</th>
<th>t-Statistic</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log I (-1)</td>
<td>-0.3214</td>
<td>0.0606</td>
<td>-5.2992</td>
<td>0.0000</td>
</tr>
<tr>
<td>Log e (-1)</td>
<td>-0.0311</td>
<td>0.0180</td>
<td>-1.7221</td>
<td>0.0894</td>
</tr>
<tr>
<td>Log G (-1)</td>
<td>-0.2683</td>
<td>0.0858</td>
<td>-3.1257</td>
<td>0.0026</td>
</tr>
<tr>
<td>Log y (-1)</td>
<td>0.7046</td>
<td>0.1492</td>
<td>4.7214</td>
<td>0.0000</td>
</tr>
<tr>
<td>r (-1)</td>
<td>0.0004</td>
<td>0.0007</td>
<td>0.6113</td>
<td>0.5430</td>
</tr>
<tr>
<td>V (-1)</td>
<td>-0.3126</td>
<td>0.1351</td>
<td>-2.3137</td>
<td>0.0234</td>
</tr>
</tbody>
</table>

Statistics of the long-term model * Statistics of the short-term model *

R squared 0.9411 0.9234
Durbin-Watson 1.9122 1.6554
JarqueBer 0.5721 0.8332
Test LM (4) 0.6156 0.0144**
Breusch-Pagan-Godfrey 0.0383** 0.0132**
Ramsey 0.0766 0.0233**
Wald: log I = log e = log g = log y = r = 0 7.14
Limit test of Pesaran, Shin, Smith (2001)
Lower 2.39
Upper 3.38

V (-1) is the speed of adjustment model
*For statistical JarqueBera, LM, Breusch-Pagan-Godfrey and Ramsey their probability is reported
**Significant at 90%
The Wald test: log I = log e = log g = log y = r = 0, has as Ho: that the parameters are equal to zero

Source: Own estimation with series drawn from INEGI

terms, it means that in an exogenous shock, the model will recover in the first period 31.26% of its condition of stability.

The statistics of the long-term model are shown in the second part of the table on the left side, except for the heteroscedasticity test that is exceeded 90%, and the rest are passed to 95%. At the same time the statistics of the short-term model are shown, passing all the tests of correct specification to 90%, except normality that is passed without problem to 95%.

The Wald test, which is extremely important in the specification of the model, is also reported, because according to the methodology of Pesaran, Shin and Smith (2001), to conclude that the model co-integrates in the long term, this test must be contrasted with the limits they report in their work, and if greater, the cointegration hypothesis will be accepted. According to our estimation the Wald test is 7.14 and the upper limit of the tables of the
Thus the final model of long-term stay as follows:

\[ I = -2.88 + -0.0938 e -0.8347 G +2.1924 y +0.0012 r \]

DISCUSSION OF RESULTS

Once the results of the model have been shown, this section has been arranged to deepen from the economic point of view, the findings above, for this, it is first necessary to be clear the value of the elasticities of each variable, which, according to Ibarra (2011) is possible to find the long term multipliers through the following formulations:

\[ e = - (e / I) = -(-0.0311 / - 0.3314) = -0.0938 \]

\[ G = - (G / I) = - (-0.2683 / -0.3314) = -0.8347 \]

\[ y = - (y / I) = - (0.7046 / -0.3314) = 2.1924 \]

\[ r = -(r / I) = - (0.0004 / -0.3314) = 0.0012 \]

Thus the final model of long-term stay as follows:

The first thing we can observe is that the exchange rate inversely influences investment decisions, so that in the face of a depreciation of the 10% exchange rate, investment usually slows down by almost 1%. This result is similar in sign to that reported in Caballero and Lopez (2011), who find a parameter of -1.63 of the real exchange rate on the investment for the period 1990 to 2008 in Mexico. As we observe, for a longer period the value of the parameter decreases, although in our case we estimate the effect of the nominal exchange rate; despite this, the most important thing is to note that the sign remains.

On the other hand, authors like Mantey and López (2010) or Caballero and López (2011) suggest that the exchange rate has an inverse effect on investment, because an increase in it raises the cost of imported raw material, increases the cost of imported technology, and also increases the amount of debt contracted in dollars, from the foregoing that the investment could be less attractive, at least for Mexican investors. All of this translates into a lower rate of return, adversely affecting investor confidence, as we had previously argued. The final conclusion will be a lower gross saving or reserve fund, a fact that will discourage investment decisions for the next periods.

Our results also show that in the face of a 1% increase in public spending, investment slows down by 0.83%. This data is evidence that the crowding-out effect is met in Mexico, which is consistent with works such as that of Calderon and Roa (2006) and that of Herrera (2003) for our country, the latter reporting an elasticity of -0.29 %. Similarly, Fonseca (2009) finds a short-term displacement effect, while for the long term it observes a weak complementarity effect.

The result shows that government spending is not always a productive output, as it had already been noticed in terms of the efficiency of public policy. The argument is more relevant when studies by ITESM (2009), COLMEX (2012)
and ASF (2015), show the inefficiency of the public policy of the Pyme’s Fund, now the National Entrepreneur Fund, which is nothing else, but public spending destined to the creation of companies (Hernández, Valencia and Rico, 2016). As we have pointed out above, we firmly believe that the failure of these programs lies in betting on projects that belong to markets with constant returns, or worse, decreasing on the scale of the rate of return, which is sharpened when much of that money usually uses to be spent for the payment of current expenditure and in many cases, is associated with a degree of corruption that diverts significantly the initial destination of resources.

The crowding-out effect can also occur when an entrepreneur plans to invest an "n" amount, and is given the option of financing that investment through some government program at very low cost or even zero, then of course deciding to bid for these resources, leaving private funds for a better occasion.

Then we have that the GDP or level of economic activity of the country is the variable with greater influence within the investment decisions, because for each percentage point that the Mexican economy grows, the investment does it in 2.19%, that means, it has an accelerating effect very important, as expected according to the theoretical frame of reference. This result is consistent with Caballero and López (2011), who find in a similar estimation a parameter of 1.09% of GDP on the investment for the period 1990-2008, and with that reported by Herrera (2003) who find by the technique of Engle-Granger a parameter of 1.68%, and by the technique of Hendry and Johansen an elasticity of 1.73%, all for a period of 1984-2002.

Given these results, it seems that actually the dependence of investment on the product is greater. As it has been said, the result is very much in line with Kalecki’s theory, as greater economic growth generates greater volume of operations in the market, which translates into inventories that empty faster and therefore their speed for being transformed into profits is greater, all this ends up motivating the entrepreneur to invest more.

Finally, in our long-term equation we have the nominal interest rate. The purists of the econometric technique will surely claim that we have reported the value of the parameter within the equation, after that in our table of results it was observed that the parameter is not significant. However we wanted to get to this section to discuss the issue, remarking that for us, it is much more important that the parameter is not significant, since we are showing that the interest rate is not a determining factor in the decisions of Investment, which is opposite to what the conventional current points out, and in a certain sense also alien to Keynes’s theory of investment determinants, since he takes into account the cost of money as an important variable. However, we must say that in a financialized economy the interest rate would probably has a significant effect through bank credit, but in a country where only 32.70% of companies are financed by bank credit (López and Valencia, 2015), it is difficult to think that the interest rate has effects at macroeconomic levels. It is also ad hoc to our chronology within the determinants of investment decisions, that is, the interest rate will come into play only until the project is viable in terms of market, so its relevance is not immediate.

This result is also similar to that reported by Caballero and López (2011) and Herrera (2003), who do not find information that contributes the interest rate as a determinant of the investment. Of course, the empirical result is very ad hoc to the theory of Michal Kalecki, who wrote that investment finances itself (Kalecki, 1954).

Conclusions

We have shown evidence of some variables that seem to motivate the decisions of businessmen to invest. We have mainly talked about the importance of the level of economic activity of a country as an engine that determines investment decisions. We also discussed expectations and their relevance in this area, and we also show how they can be generated and how they have behaved in the last years. Through the product life cycle model we create a scheme that shows the behavior of the rate of return with respect to the investment and we have spliced it with the life cycle of the product. With this scheme we have taken advantage of to discuss the efficiency of offering resources at a very low or zero cost, as well as the inefficiency of government policy promoting this type of support. Finally, with an ARDL-type econometric model, we have tested everything discussed above, finding that the level of economic activity is the main cause of investment decisions, and that the exchange rate also has a negative effect on investment, since it raises The direct costs and this reduces the return rate affecting the future expectations of the investors and therefore reducing the investment. Our model also reports that the crowding-out effect is present in Mexico, which may be due to the fact that investors in many cases prefer to use public rather than private resources to carry out their projects. An additional result is that the interest rate is inefficient to stimulate investment in the first place because the resources are usually channeled to markets with rates of return with constant or decreasing returns to scale, and finally because Mexico is not a financialized economy, which has minimal impact at the macroeconomic level.

REFERENCES

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